Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	0	36715-24.ccls. and ((source or airgun or "air gun") with absorb)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/01 17:28
L2	0	36715-24.ccls. and ((source or airgun or "air gun") with absorbs)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/01 17:28
L3	0	36715-24.ccls. and ((source or airgun or "air gun") with absorbtion)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/01 17:28
S1	135	367/24.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/01 14:30
S2	148	kragh.in.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/03/31 14:29
S3	7	kragh.in. and seismic and marine	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/03/31 14:42
S4	228	367/21.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/03/31 14:38
S5	149	181/110.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/03/31 14:39

S6	2	("4353121" | "4520467").PN. OR ("6681887").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2005/03/31 14:39
S7	16	("2757356" | "3747055" | "4222266" | "4486865" | "4979150" | "5051961" | "5365492" | "5524100" | "5581514" | "5621700" | "5696734" | "5754492" | "5850922" | "6101448" | "6493636"). PN. OR ("6775618").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2005/03/31 14:39
S8	0	GB222223	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/03/31 14:43
S9	0	GB222223$	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/03/31 14:43
S10	12	howlid.in.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/03/31 14:57
S11	36	seismic and marine and ghost and notch	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/03/31 14:57
S12	40	seismic and marine and ghost and (frequency adj spectrum)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/03/31 14:57
S13	56	S11 S12	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/03/31 14:58
S14	7	"5142498"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/01 14:25

S15	9	("4146870" | "4721180" | "4727956" | "4956822" | "5142498").PN. OR ("5281773").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2005/04/01 14:29
S16	11	367/24.ccls. and (ghost with notch)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/01 14:30
S17	9	367/24.ccls. and (ghost with notch with frequency)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/01 14:30
S18	11	367/24.ccls. and (positive near5 reflection)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/01 17:07
S19	0	367/24.ccls. and ((source or airgun or "air gun") with absorb$)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/01 17:28

Query/Command : prt ss 1 1-7 ti so au ab

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1 / 7 TULSA - ©TULS

TI - ROUGH-SEA DEGHOSTING USING A SINGLE STREAMER AND A PRESSURE GRADIENT APPROXIMATION

SO - GEOPHYSICS V 67, NO 6, PP 2005-2011, NOV-DEC 2002 (COLOR; 11 REFS)

AU - ROBERTSON, J O A; KRAGH, E

AB - A method is presented for receiver **ghost** correction of towed streamer data that accounts for the rough sea surface. The method explicitly uses the fact that the pressure is zero at the free (sea) surface to estimate the vertical pressure gradient. Continuous elevation measurements of the wave height directly above the hydrophones are required--a measurement which is currently unavailable. The new deghosting method is fundamentally limited to frequencies below the first **ghost notch**. The lowest-order implementation requires that the streamer is towed no deeper than approx. 6 m and a receiver spatial sampling interval of ca 3 m or less. Using the lowest-order and simplest implementation of the new method, the rough-sea error is reduced from 1.5-2.5 dB to ca 1-1.5 dB in amplitude and from 20(deg) to 10(deg) in phase, at 50 Hz in a 4-m significant wave height sea. Higher-order terms in the approximation promise to further reduce the error.

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2 / 7 TULSA - ©TULS

TI - USING A **SEISMIC** REFLECTOR FOR RESOLVING STREAMER DEPTH AND SEA SURFACE PROFILES

SO - FIRST BREAK V 18, NO 11, PP 463-467, NOV 2000 (COLOR; 6 REFS)

AU - KRAGH, E; COMBEE, L

AB - The depth profile of a towed streamer and the shape of the sea surface above the towed streamer, at a particular instant, can be obtained from travel time and **ghost notch** frequency analysis on an isolated **seismic** reflector. The resulting streamer profiles indicate smooth long wavelength variations that do not follow the sea surface profiles. The sea surface profiles exhibit a dominant wavelength and amplitude that is consistent with an ocean wave spectrum. Both streamer and sea surface results are consistent with observation logs. A nonhorizontal streamer depth profile introduces static shifts into the data and, combined with the sea-surface shape, perturbs the data bandwidth through changes in the **ghost notch** frequency. If both streamer and sea-surface profile were known, it might be possible to correct the data for these perturbations. Furthermore, detailed information on the streamer depth profile can be used for streamer depth quality control.

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3 / 7 TULSA - ©TULS

TI - **MARINE SEISMIC** SIGNAL ANALYSIS METHOD

SO - GR BRIT 2,344,889A, P 2000.06.21, F 1999.11.18, PR GR BRIT 1998.12.18 (APPL 9,828,066) (G01V-001/38) (29 PP; 22 CLAIMS)

AU - KRAGH, J E; COMBEE, L

AB - A method of analyzing **marine seismic** data includes sensing a receiver **ghost** signal using a submerged acoustic sensor, and estimating the height of the water column above the acoustic sensor using the receiver **ghost notch** frequency in a time window framing a well-defined event. The method may further include identifying changes in arrival times from **seismic** signals received by a number of submerged acoustic sensors located at different offsets from an acoustic source; determining time differences between the identified changes in arrival times and expected changes in arrival times associated with an assumed acoustic sensor depth profile; and converting the time differences into depth differences between the assumed acoustic sensor

depth profile and the actual depth profile of the acoustic sensors. This method provides for determination of local wave heights and acoustic sensor elevations and allows noise in **seismic** data associated with changes in local wave heights and **seismic** sensor elevations to be attenuated during subsequent data processing.

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4 / 7 TULSA - ©TULS

TI - CONTROLLED PHASE **MARINE** SOURCE ARRAY

SO - US 5,142,498, C 92.08.25, F 91.08.28 (APPL 751,295) (G01V-001/38) (29 PP; 23 CLAIMS)

AU - DUREN, R E

AB - METHODS FOR THE CONSTRUCTION OF AND CONTROLLED PHASE **MARINE** SOURCE ARRAYS PROVIDE PHASE CONTROL FOR SOURCE ARRAY PULSES RADIATED INTO EMERGENCE (OR INCIDENCE) ANGLES OF INTEREST. PHASE CONTROL MEANS THAT THE PHASE SPECTRA ASSOCIATED WITH SOURCE ARRAY PULSES RADIATED IN A GENERALLY DOWNGOING DIRECTION, (I.E., FOR ANGLES OF EMERGENCE FROM THE ARRAY THAT ARE OF INTEREST) WILL MATCH THE PHASE SPECTRUM ASSOCIATED WITH A VERTICALLY DOWNGOING SOURCE ARRAY PULSE OUT TO THE **GHOST-NOTCH** FREQUENCY ASSOCIATED WITH THE VERTICALLY DOWNGOING PULSE. ALTHOUGH THE RANGE OF EMERGENCE ANGLES OVER WHICH PHASE CONTROL IS POSSIBLE MAY BE LIMITED BY THE ARRAY GEOMETRY, PROPER ATTENTION TO AND CONTROL OF ARRAY GEOMETRY AND THE RADIATION CHARACTERISTICS OF THE INDIVIDUAL ARRAY SORUCE ELEMENTS PROVIDE SUCH CONTROLLED PHASE **MARINE** ARRAYS.

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5 / 7 TULSA - ©TULS

TI - A DUAL-SENSOR BOTTOM-CABLE 3-D SURVEY IN THE GULF OF MEXICO

SO - 60TH ANNU SEG INT MTG (SAN FRANCISCO, 90.09.23-27) EXPANDED TECH PROGRAM ABSTR BIOGR V 1, PP 855-858, 1990 (ISBN 1-56080-013-5; PAP NO SA1 2; 2 REFS; ABSTRACT ONLY) (AO)

AU - BARR, F J; WRIGHT, R M; ABRIEL, W L; OBKIRCHNER, S; WOMACK, B A; SANDERS, J I

AB - MANY OLD OIL FIELDS IN THE GULF OF MEXICO HAVE CLUSTERS OF PRODUCTION PLATFORMS THAT MAKE CLOSELY SPACED, 3- DIMENSIONAL DEEP-WATER **MARINE** STREAMER ACQUISITION DIFFICULT. MODERN 2-BOAT ACQUISITION USING MULTIPLE ALIGNMENTS AND MULTIPLE PASSES HAS BEEN SHOWN TO DO A CREDITABLE JOB IF THE GEOLOGIC OBJECTIVES ARE FAIRLY DEEP. THIS TECHNIQUE IS ALSO QUITE EXPENSIVE. IN SHALLOW WATER AREAS, BOTTOM-CABLE CREWS CAN OBTAIN DATA NEXT TO THE PLATFORMS AT LESS COST. HOWEVER, THE **GHOST NOTCH** CAUSED BY THE THICKNESS OF THE WATER LAYER ABOVE THE BOTTOM CABLE AND THE RESULTANT LONG PERIOD REVERBERATIONS CAN CAUSE SEVERE DETERIORATION OF THE FREQUENCY CONTENT THAT IS ESSENTIAL TO MAP THE SHALLOW REFLECTORS AND ASSOCIATED SMALL FAULTING. THIS METHOD ADDRESSES THE PROBLEM OF THE **GHOST NOTCH** EXPERIENCED WHEN USING BOTTOM-CABLES TO CONDUCT A 3- DIMENSIONAL **SEISMIC** SURVEY IN 50 TO 90 FT OF WATER. IT HOLDS CONSIDERABLE PROMISE FOR OBTAINING 3-DIMENSIONAL SURVEYS IN TIGHTLY CONGESTED DRILLING AREAS OF MEDIUM WATER DEPTH. (LONGER ABSTRACT AVAILABLE) (ORIGINAL ARTICLE NOT AVAILABLE FROM T.U.)

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6 / 7 TULSA - ©TULS

TI - HIGH RESOLUTION, **MARINE SEISMIC** STRATIGRAPHIC SYSTEM

SO - CAN 1,187,594, C 85.05.21, F 81.04.09, PR US 80.07.24 (APPL 925) (FAIRFIELD INDUSTRIES INC) (23 CLAIMS)

AU - RAY, C H; MOORE, N A

AB - A HIGH RESOLUTION **MARINE SEISMIC** STRATIGRAPHIC SYSTEM HAS A BROAD FREQUENCY SPECTRUM SOURCE ASSOCIATED WITH A VESSEL ALSO TOWING A DETECTOR CABLE. THIS CABLE OR STREAMER INCLUDES A NUMBER OF HYDROPHONES OR HYDROPHONE DETECTOR ARRAYS; THE CLOSEST ONE TO THE VESSEL IS AT A DEPTH OF 3 M BENEATH THE WATER SURFACE. THE CABLE IS BUOYANTLY CONTROLLED TO SLOPE SO THAT THE DETECTOR FURTHEREST FROM THE VESSEL IS AT A DEPTH OF 38 M. FOR EACH REFLECTING INTERFACE, BECAUSE OF THE SLOPE OF THE CABLE, THE PRIMARY AND **GHOST** REFLECTIONS BECOME FURTHER AND FURTHER APART FOR DETECTORS FURTHER AND FURTHER FROM THE SOURCE. THE NORMAL MOVEOUT CORRECTION IS APPLIED, AND THE **GHOST** REFLECTIONS ARE TIME ALIGNED AND STACKED IN THE TIME DOMAIN TO PRODUCE AN AUGMENTED **GHOST** STACK WHILE NOT ENHANCING THE PRIMARY STACK. THE 2 STACKS ARE THEN ADDED TO PRODUCE AN EFFECTIVE 48-FOLD STACK. THERE IS NO AMPLITUDE OR PHASE DISTORTION PRODUCED BY THE GHOSTING PHENOMENON AND THERE IS A COMPLETE AVOIDANCE OF THE USE OF ANY INVERSE **NOTCH** FILTER. (23 CLAIMS)

7/7 TULSA - ©TULS

TI - HIGH RESOLUTION, **MARINE SEISMIC** STRATIGRAPHIC SYSTEM

SO - US 4,353,121, C 82.10.05, F 80.07.24 (APPL 179,283) (FAIRFIELD INDUSTRIES INC) (23 CLAIMS)

AU - RAY, C H; MOORE, N A

AB - A HIGH RESOLUTION, HIGH PENETRATION **MARINE SEISMIC** STRATIGRAPHIC SYSTEM IS DESCRIBED WHEREIN A SLANTED CABLE COMPRISING SPACED-APART HYDROPHONE ARRAYS GATHER **SEISMIC** REFLECTIONS SO THAT THE CORRESPONDING PRIMARY AND **GHOST** REFLECTIONS FROM A COMMON INTERFACE GRADUALLY ARE SPACED APART. THE PRIMARY REFLECTIONS ARE TIME ALIGNED AND STACKED. THE **GHOST** REFLECTIONS ARE PHASE REVERSED, TIME SHIFTED, AND TIME ALIGNED TO COINCIDE WITH THE TIME ALIGNED PRIMARY STACK AND THEN STACKED TO GIVE A COMBINED PRIMARY AND **GHOST** STACK, WHICH EFFECTIVELY INCLUDES ALMOST TWICE THE INFORMATION AS FROM THE PRIMARY STACK ALONE. NO INVERSE **NOTCH** FILTERS ARE NEEDED TO CORRECT FOR THE **GHOST** PHENOMENON. FOCUSED NOISE OUT OF THE VERTICAL PLANE ALSO IS VIRTUALLY ELIMINATED. (23 CLAIMS)

Search statement 2